UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
1 CONGRESS STREET, SUITE 1100 (HBT)
BOSTON, MASSACHUSETTS 02114-2023

April 19, 2006

Orlando Monaco (orlando.monaco@navy.mil)
Dept of the Navy, BRAC PMO Northeast
Code 5090 BPMO NE/LM
4911 South Broad St
Philadelphia, PA 19112-1303

Re: Sites 1, 3, and Eastern Plume, Monitoring Event 26 (April 2005) Report, dated March 2006, Naval Air Station Brunswick, Maine

Dear Mr. Monaco:

Pursuant to § 6 of the Naval Air Station Brunswick, Maine Federal Facility Agreement dated October 19, 1990, as amended (FFA), the Environmental Protection Agency has reviewed the subject document and comments are below:

General Comments:

1. Results from Event 26 are generally consistent with recent trends (see, e.g., Appendix C), particularly for VOCs. Notable exceptions include:

- Metals concentrations at MW-218 (downgradient of Sites 1 and 3) "spiked" relative to previous rounds. Arsenic was detected at 360 micrograms per liter. These results could be related to a number of factors. ORP was measured at -135 mV, conditions conducive to mobilization of hydrous ferric oxides and sorbed metals (including As). However, it is noted that ORP was similarly low in ME25 (-69 mV), while metals concentrations were considerably lower. Second, this well tends to yield turbid samples (25 NTU in ME26), so some of the elevated metals could be due to particulates. Again, however, it is note that turbidity was even higher in ME25 (54 NTU), while metals concentrations were lower. Finally, Spring 2005 was unusually wet, so hydrologic conditions may have been somewhat anomalous.

- VOCs "spiked" at MW-332 (shallow well downgradient of EW-2A), although total VOCs were within the historical range. TCE was detected at 45 micrograms per liter, following several rounds at significantly lower levels. Again, a number of phenomena could have influenced VOC concentrations at this location, including extended down time for the nearby extraction well (EW-2A), transient changes in hydrology in response to high rainfall in Spring 2005, and the continued evolution of the plume as portions discharge upward to surface water in this area.

2. The recommendations presented in section 3.1 generally are well motivated, and are endorsed, with a few minor questions that demand further clarification and/or discussion. Please see, in particular, Specific Comment related to "background" well MW-1104 for the MNA assessment.

Specific Comments:
3. p. 1-1, sec. 1.0, and Fig. 1-2: The legend for Figure 1-2 shows that the "Approximate Limits of Eastern Plume in 2003" are shown in red. It appears that this domain is outlined in black. Please check for consistency.

4. p. 1-2, sec. 1.2: Please add a statement summarizing the status of the new monitoring wells downgradient of the slurry wall (presumably not yet installed or available for sampling at the time of ME26).

5. § 1.5 Analytical Data Quality Review: The VOC data was biased low according to appendix D. What implication does this have on the use of this data for LTM? What corrective actions were implemented at the Lab ?

6. p. 2-2, sec. 2.2: As noted in EPA review comments on the ME25 report, the interpreted potential surfaces shown for shallow (Figure 1-4) and deep (Figure 1-5) overburden groundwater are incorrect in the neighborhood of the slurry wall. The interpretations ignore the presence of the impermeable barrier, and attempt to contour a continuous surface. However, due to the presence of the wall, it is expected that the potential is discontinuous (e.g., it jumps from high values just upgradient of the wall (e.g., MW-201R at 48.19 ft msl) to lower values immediately inside the wall (e.g., EP-19 at 31.15 ft msl)). Equipotentials are not expected to cross the slurry wall. Also, all contours should intersect the wall perpendicular to the impermeable surface. The expected result would show flow diverging around the wall on the outside, and a "plateau" inside. The average condition likely shows a very slight overall gradient from north to south within the wall that balances weak upward seepage from beneath the enclosed area. Please revise the contour maps to account for the impermeable barrier.

7. p. 2-2, sec. 2.3: The bar graphs showing concentrations over ten monitoring events provide a nice visualization of trends. Some of the qualitative "trend assessments" appear to be inconsistent with the data as shown. In particular, PCE in MW-313 is described as decreasing, while the bar graph suggests that TCE is either fluctuating within its recent historical range, or possibly increasing (e.g., over the past five rounds). TCE in the same well is described as increasing, apparently based on some small changes in the last few rounds, all at relatively low concentrations (e.g., the ME26 result is qualified J). This does not exhibit a convincing increasing trend. In well MW-331, the trend assessment notes an increasing trend for TCE and a decreasing trend for 1,1,1-TCA, yet both appear to be highly correlated, having peaked in concentration in ME21, and declined overall since then. Please review the qualitative assessments for consistency. Consideration should be given to adopting a more formal, statistical evaluation of trend, such as the Mann-Kendall test.

8. § 2.3.1 Monitoring Wells: MW-218. Was the spike in 1997 TCE also? What was the value?

9. p. 2-6, sec. 2.5.1, MW-332: The bar graph for total VOCs shown in the summary for MW-332 does not appear to agree with the trend plot provided in Appendix C. Total VOCs in ME24 are shown in Appendix C at about half the concentration detected in ME26, while the bar graph on p. 2-6 shows total

VOCs higher in ME24 than in ME26. Please verify and correct if necessary. This is particularly significant here, because it appears from the trend plot in Appendix C that VOCs have been rising in concentration at this location fairly persistently over the past five rounds, and this is obscured somewhat by the total VOC bar graph provided in the text. Although the jump in 1,1-DCE is described as a "spike," and is indeed a significant increase from ME25 (ND? to 15J ppb), it appears to be part of a fairly consistent trend that includes 1,1,1-TCA. It is noted, too, that the appearance of "spikes" is exacerbated by the seasonal fluctuations observed consistently at this well, with VOC concentrations notably higher in the spring round than in the fall round.

9. § 2.5.2 Monitoring Wells-Deep: Please include wells where 1,4 dioxane is above MEGs such as MW-313.

10. p. 2-10, sec. 2.5.3: The analytical results for individual extraction wells and for the combined influent provide a useful measure of system performance and the evolution of the plume near the extraction points. While it is understood that the summary tables show only compounds found to be in exceedance of the appropriate water quality standards for brevity, it would be useful in this particular section to include the analytical results for 1,1,1-TCA because of its importance as a primary contaminant. The reader would benefit from a quick impression of the current concentrations of 1,1,1-TCA at the extraction wells and the trends (i.e., the bar graphs).

11. p. 2-12, sec. 2.6.1: The text notes that MW-1104 was selected as a "background" well for the MNA assessment, particularly with respect to chloride and alkalinity. At a previous meeting between Navy, its contractors, and state and federal regulators, there was some discussion of using several wells believed to be outside the plume footprint to provide a more representative "background" condition. Is it still the intent of Navy to pursue this approach?

12. p. 2-12, sec. 2.6.2, and Fig. 2-5: The figure shows continuous green stippling (limited evidence) in areas where the scores are low (<6), including those near MW-306 (1), MW-305 (5), and P-111 (4). This may give a more optimistic view of the potential for MNA than is warranted. If these locations were to be stippled blue (inadequate evidence), it might suggest that conditions on the northeast and northwest flanks of the plume are not favorable to degradation, and that portions of the axial domain that are more favorable may be discontinuous (e.g., between MW-NASB-212 / MW-303 to the north and MW-331 midplume. Please revise the stippling so that it does not overstate the case for conditions favorable to degradation.

13. p. 3-1, sec. 3.1, second bullet: It is agreed that much of the plume domain has been shown to be unfavorable for biodegradation, and that continued monitoring of MNA parameters in this region is of limited value. The report recommends that the "background" well MW-1104 be eliminated from the MNA analytical program. However, there are still unresolved issue with respect to establishing meaningful "background" conditions (e.g., for chloride and alkalinity). For this reason, a final determination should be made on what well or wells offer the most appropriate measures of "background" before any wells are removed from the program. Furthermore, if Navy envisions an appeal to natural attenuation as a part of the remedy for the Eastern Plume, it may be necessary to resample some of the wells periodically in order to delineate the evolving zone of potential reductive dechlorination.

14. §3.1 Conclusions and Recommendations, 4th bullet: Analytical results in seep 3 should continue to be monitored.

15. p. 3-2, sec. 3.1, first bullet: It is agreed that the evolution of the leading edge of the plume in the vicinity of MW-333 and MW-313, as well as the groundwater – surface water interaction, are significant issues that warrant further investigation, as noted. However, the first sentence of this bullet is somewhat misleading. First, it appears from the plots in Appendix C that it is 1,1-DCA and 1,1-DCE (rather than 1,2-DCE) that have been changing at these locations. This is significant, in that both 1,1-DCA and 1,1-DCE are known to be breakdown products of 1,1,1-TCA, while (cis-)1,2-DCE is a degradation product of TCE. At MW-333, the plot provided in Appendix C shows an increasing trend for 1,1-DCE and 1,1-DCA, with an anomalous "spike" in Spring 2001. (Note that the apparent drop in 1,1-DCA shown on the Appendix C plot is potentially misleading, because this compound was reported at 10U micrograms per liter in ME26, i.e., the detection limit achieved is above the concentration reported in ME25 of 5.4 micrograms per liter. For this reason, it is plotted as a decline, but that may not be the case.) At MW-313, the recent historical pattern is quite different, showing a maximum in VOC detections in Spring 2002, with a general decline since then. The last three rounds (ME24-26) suggest a rising trend, but concentrations are still below their peak in Fall 2003, and well below their maximum in Spring 2002.

16. p. 3-3, sec. 3.1, last bullet: The text notes that MW-1104 may not be an appropriate choice as a "background" well for the MNA assessment. As noted above, there seemed to be a consensus on this point at a meeting between Navy, its contractors, and state and federal regulators in 2005. There was some discussion at that time of using several wells believed to be outside the plume footprint to provide a more representative assessment of "background" conditions. It is possible that this approach could take advantage of existing wells, some of which may already be in the Eastern Plume monitoring program.

17. Figure 2-1 indicate if any of the contaminants at MW-332 are above MEGs or MCLs. This figure demonstrates the need for additional shallow monitoring points near and downstream of the Merriconeag Stream/ Mere Brook confluence. Why has MW202A had CVOCs detected when it is outside of the landfill?

If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,

Christine A.P. Williams, RPM
Federal Facilities Superfund Section

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